

March 8, 2017

VIA ELECTRONIC FILING

Ms. Jocelyn Boyd
Chief Clerk & Administrator
Public Service Commission of South Carolina
Synergy Business Park, Saluda Building
101 Executive Center Drive, Suite 100
Columbia, SC 29210

Re: **McCutcheon v. Duke Energy Carolinas, LLC**
Docket No. 2017-32-E

Dear Ms. Boyd:

Enclosed for filing please find the Direct Testimony of Joel M. Lunsford, Theo L. Lane and Douglas T. Fowler, Jr. on behalf of Duke Energy Carolinas, LLC's in the referenced docket. Copies of the testimony are being served on the parties of record by electronic mail. Should you have any questions, please contact me.

Yours truly,



Frank R. Ellerbe, III

FRE:tch

Enclosure

cc w/enc: Alexander G. Shissias, Esquire (via email)
John J. Fantry Jr., Esquire (via email)
Jeffrey M. Nelson, Chief Counsel, Director-Legal Services (via email)
Heather Shirley Smith, Deputy General Counsel (via email)
Rebecca J. Dulin, Senior Counsel (via email)
Kim H. Smith, Regulatory Affairs (via email)

**BEFORE
THE PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA**

Docket No. 2017-32-E

In Re:

Tommy McCutcheon,

Complainant/Petitioner,

v.

Duke Energy Carolinas, LLC

Defendant/Respondent.

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CERTIFICATE OF SERVICE

This is to certify that I, Toni C. Hawkins, a paralegal with the law firm of Sowell Gray Robinson Stepp & Laffitte, LLC, have this day caused to be served upon the person(s) named below the Direct Testimony of Joel M. Lunsford, Theo L. Lane and Douglas T. Fowler, Jr. on behalf of Duke Energy Carolinas, LLC in the foregoing matter by electronic mail to the following addresses:

Alexander G. Shissias, Esquire
alex@shissiaslawfirm.com

Jeffrey M. Nelson, Esquire
jnelson@regstaff.sc.gov

John J. Fantry, Jr., Esquire
john@fantrylaw.com

Dated this 8th day of March, 2017.



**BEFORE
THE PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA**

Docket No. 2017-32-E

In Re:)
)
3109 Hwy. 25 S. L.L.C. d/b/a 25 Drive-In)
and Tommy McCutcheon,)
)
Complainant/Petitioner,)
)
v.)
)
Duke Energy Carolinas, LLC)
)
Defendant/Respondent.)

**DIRECT TESTIMONY

OF

JOEL M. LUNSFORD

ON BEHALF OF DUKE ENERGY CAROLINAS, LLC**

1 **Q PLEASE STATE YOUR NAME, CURRENT POSITION, AND BUSINESS**
2 **ADDRESS.**

3 A My name is Joel M. Lunsford. I am the General Manager, Construction and Maintenance,
4 for Duke Energy Carolinas (“DEC”). In my current position as General Manager of
5 Construction and Maintenance, I am responsible for the distribution grid in the Upstate of
6 South Carolina. My business address is 1636 Pearman Dairy Road, Anderson, SC 29625.

7 **Q PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL**
8 **BACKGROUND.**

9 A I graduated from Clemson University in 1982 with a B.S. in Electrical and Computer
10 Engineering. After graduating from Clemson, I began my career with Duke Energy and
11 have been employed by DEC for approximately thirty-five years. I am a licensed
12 professional engineer, having first obtained my license in 1986. My license has been active
13 at all times since I first obtained it. Throughout my career as a licensed professional
14 engineer, I have experience in the areas of transmission, distribution, underground network,
15 training, safety, and standards. On numerous occasions during my work for DEC I have
16 been involved in determinations of the proper equipment and facilities that were necessary
17 to provide service to various customers in a safe and efficient way. That type of analysis
18 is very similar to the subject of my testimony in this case.

19 **Q WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

20 A The purpose of my testimony is to respond to allegations made in the Complaint filed by
21 Petitioner Tommy McCutcheon (“McCutcheon”), to respond to the opinions offered on
22 behalf of McCutcheon by James R. Calhoun (“Calhoun”), and to state my opinions

1 concerning the electrical failures that occurred at McCutcheon's drive-in movie theater
2 located at 3109 Hwy 25 South in Greenwood County, South Carolina (the "Drive-In").

3 **Q PLEASE STATE WHAT ACTIONS YOU HAVE TAKEN IN ORDER TO**
4 **PREPARE YOUR TESTIMONY IN THIS CASE.**

5 A I have reviewed the Complaint, the Affidavit and Pre-filed Testimony of McCutcheon, the
6 Affidavit and Pre-Filed Testimony of Calhoun, and the exhibits filed on behalf of
7 McCutcheon. I have also reviewed DEC's records relating to the Drive-In and spoken with
8 the DEC individuals who addressed the electrical failures at the Drive-In and I have visited
9 the Drive-In. I am familiar with the facilities and equipment that were in place to serve the
10 Drive-In prior to June, 2015 and with the facilities and equipment that were installed as
11 part of the June 2015 upgrade.

12 **Q IS IT YOUR UNDERSTANDING THAT THE DRIVE-IN EXPERIENCED TWO**
13 **POWER FAILURES IN MAY AND JUNE OF 2015?**

14 A Yes.

15 **Q DO YOU HAVE AN OPINION CONCERNING THE CAUSE OF THE MAY AND**
16 **JUNE 2015 POWER FAILURES AT THE DRIVE-IN?**

17 A Yes. In my professional opinion, the power failures were caused by thermal overload.

18 **Q EXPLAIN WHAT YOU MEAN BY THERMAL OVERLOAD.**

19 A Any conductor used to deliver electricity from one point to another is designed to safely
20 carry a certain maximum load. If the conductor is used to try to carry a load in excess of
21 what it is designed to carry it will heat up. Eventually the insulation can melt and even
22 cause a fire.

1 **Q CAN YOU GIVE AN EXAMPLE OF THERMAL OVERLOAD THAT MIGHT BE**
2 **EXPERIENCED BY NON-ELECTRICIANS?**

3 A Yes. Any hardware store will carry various types of extension cords that are designed for
4 different applications, from a basic thin extension cord that you might use to plug in a lamp
5 to a heavy duty cord designed to safely conduct sufficient power to operate something like
6 a power tool. Anyone who has used a small extension cord to try to operate an appliance
7 that requires a significant load has probably felt the cord get hot. That is thermal overload.

8 **Q WHAT IS THE BASIS FOR YOUR OPINION THAT THE MAY AND JUNE 2015**
9 **POWER FAILURES AT THE DRIVE-IN WERE CAUSED BY THERMAL**
10 **OVERLOAD?**

11 A At the time of the power failures, the Drive-In was served by a single triplex overhead 2/0-
12 3 conductor with polyethylene insulation rated at 75 degrees Celsius. The continuous
13 amperage rating for this type cable is 185 amperes. I believe that in June 2015 the Drive-
14 In had a demand load of at least 225 amperes, significantly higher than the capacity of the
15 conductor. It is my opinion that the overloaded line overheated and melted the insulation
16 causing the fires and the power outage.

17 **Q WHAT IS THE BASIS FOR YOUR OPINION THAT THE DEMAND LOAD OF**
18 **THE DRIVE-IN WAS AT LEAST 225 AMPERES?**

19 A. Prior to June 2015 there was no demand meter in place serving the Drive-In so we don't
20 have a direct record of the demand load at the time of the fires. However, when the
21 facilities were upgraded a kilowatt demand meter was installed at the Drive-In. Based on
22 what we know about operations of the Drive-In, I think the demand readings following the

1 upgrade are indicative of the peak demand during the period leading up to the fires.
2 Readings from June of 2015 show that the Drive-In's maximum load was 49.4 kilowatts.
3 This equates to 225 amperes of demand load which is the figure I used in reaching my
4 conclusion that the overhead service line to the Drive-In was loaded at 122% of its rating.

5 **Q ARE THERE OTHER RECORDS OF DEC THAT SUPPORT YOUR**
6 **CONCLUSION?**

7 A Yes. The spreadsheet attached as **Exhibit A** shows the annual usage for the Drive-In from
8 2004 through 2016. The spreadsheet was compiled from the business records of DEC that
9 are created continuously as we deliver service and then maintained by the company. The
10 values given in the chart are in Kilowatt Hours which shows total annual usage and doesn't
11 directly show what the demand was at any given point. However, the overall usage
12 increased significantly after 2008 and continued to increase leading up to the problems that
13 were experienced in 2015. These DEC records show an increase in the overall load in the
14 operation of the Drive-In. Given what we know about the typical demand of an operation
15 like a drive-in theater, with most of the demand for projection, cooking and cooling all
16 occurring at about the same time of day, I would expect the overall increased power usage
17 of the Drive-In to result in the type of increased peak demand that I think caused the thermal
18 overload.

19 **Q DO YOU HAVE A DIAGRAM THAT ILLUSTRATES THE ELECTRICAL**
20 **SERVICE PROVIDED TO THE DRIVE-IN IN MAY AND JUNE OF 2015?**

1 A Yes. The diagram attached as **Exhibit B** does that. The diagram shows the current
2 transformer, the 2/0-3 conductor, and the delivery point. The diagram also shows the
3 approximate location of the conductor failure due to thermal overload.

4 **Q IS IT YOUR UNDERSTANDING THAT DURING BOTH OUTAGES A FUSE WAS**
5 **BLOWN ON THE POLE MOUNTED TRANSFORMER THAT SERVES THE**
6 **DRIVE-IN?**

7 A Yes.

8 **Q IS THAT FACT CONSISTENT WITH YOUR EXPLANATION OF HOW THE**
9 **TWO INCIDENTS OCCURRED?**

10 A Yes. One of the reasons that there is a fuse in the transformer is to stop the delivery of
11 electricity to a service line that is overloaded. In both incidents the fuse worked as it was
12 intended, shutting down the flow of electricity to a service line that was being damaged as
13 a result of thermal overload.

14 **Q EXPLAIN THE FUNCTION OF THE CURRENT TRANSFORMER THAT IS**
15 **SHOWN ON THE DIAGRAM.**

16 A The current transformer metered the electricity usage of the Drive-In.

17 **Q DO YOU AGREE WITH MR. CALHOUN'S OPINION THAT THE ELECTRICAL**
18 **FAILURE DESTROYED THE 800/5 CURRENT TRANSFORMER?**

19 A No, I do not.

20 **Q WHAT IS THE BASIS FOR YOUR OPINION?**

21 A The 800/5 current transformer was not destroyed. I have confirmed with the DEC
22 employees that it was not destroyed but was replaced as part of the upgrade. Additional

1 proof that the old current transformer was not destroyed is that if it had been destroyed, it
2 would have stopped metering. It did not stop metering – we have metering readings from
3 May 30th through June 17th. If the meter had been destroyed during either of the outage
4 events it would have stopped functioning. Therefore, we know that the current transformer
5 was not destroyed.

6 **Q DID DEC REPAIR THE METERING INFRASTRUCTURE AT THE DRIVE-IN?**

7 A No. The metering infrastructure was never damaged. DEC simply upgraded the meter
8 installation to a new metering standard that provides more accurate meter readings.

9 **Q IN YOUR OPINION, DID THE EXISTING ELECTRICAL SYSTEM AT THE**
10 **DRIVE-IN IN MAY AND JUNE OF 2015 POSE A SAFETY HAZARD?**

11 A Absolutely. The existing electrical cables were insufficient to handle the thermal load at
12 the Drive-In and posed a fire risk. This is evidenced by the fact that on two separate
13 occasions in May and June of 2015, the Drive-In suffered loss of electrical power as a result
14 of a melted electrical cable.

15 **Q DO YOU AGREE WITH MR. CALHOUN'S STATEMENT THAT THE DRIVE-**
16 **IN'S "SERVICE ON ITS SIDE IS NOW AND HAS ALWAYS BEEN A 400**
17 **AMPERE SERVICE, WHICH COULD NOT HAVE OVERLOADED [DEC'S]**
18 **POWER SYSTEM?**

19 A No. Service size, as described by an electrician, is a function of the amperage of the main
20 breaker and has no influence on the load demand of the customer's electric system. The
21 electrical failures in this matter were caused by thermal overload.

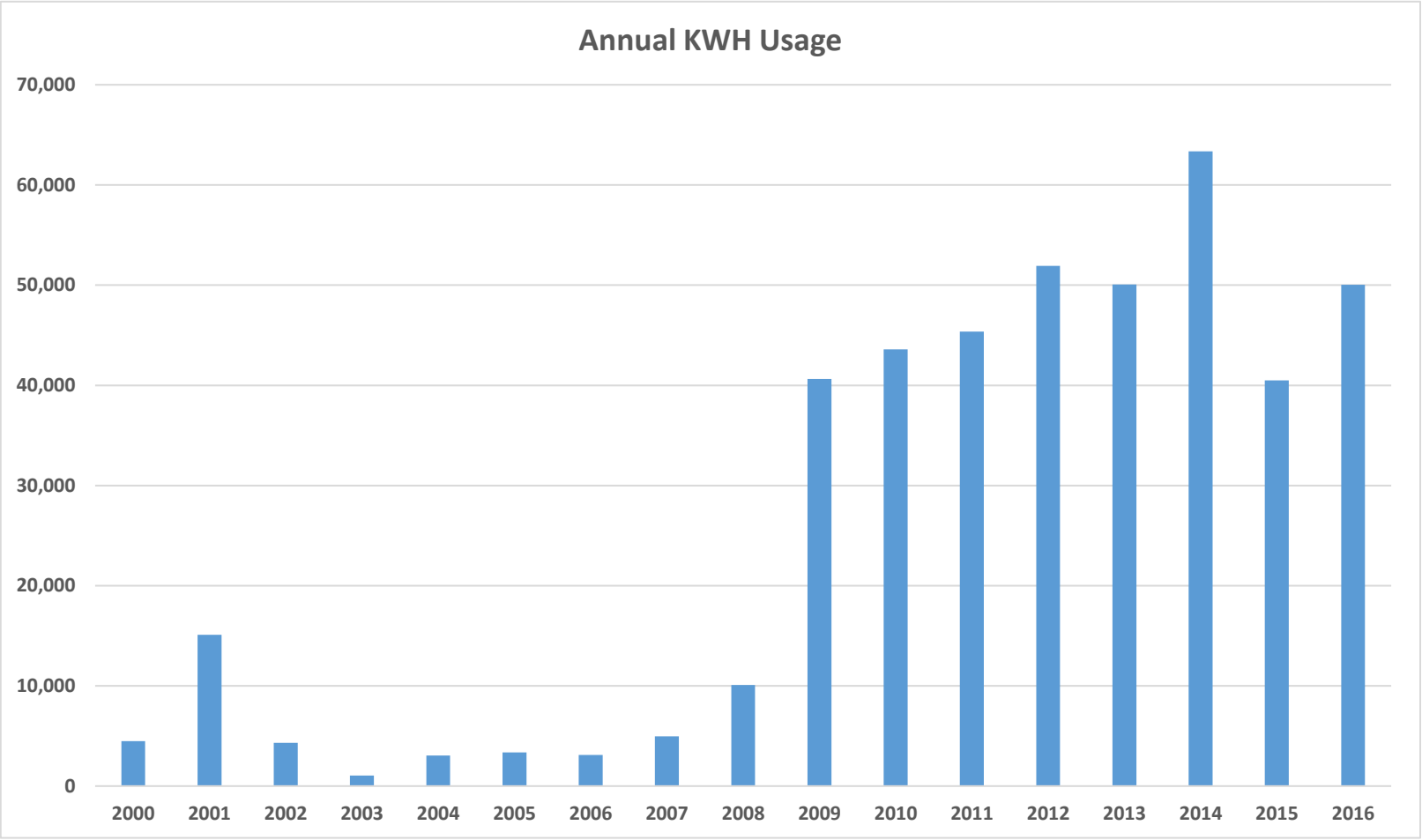
1 **Q AFTER THE MAY AND JUNE 2015 POWER FAILURES AT THE DRIVE-IN,**
2 **WAS IT NECESSARY FOR DEC TO CHANGE THE CHARACTER OF THE**
3 **CONNECTION AT THE DRIVE-IN?**

4 A Yes. The overhead service conductors were thermally overloaded and posed a risk of fire.
5 It was necessary to upgrade the customer to ensure that electricity was supplied to the
6 Drive-In in a manner that was safe.

7 **Q DOES THIS CONCLUDE YOUR TESTIMONY?**

8 A Yes it does.

Year	Total KWH Usage
2000	4,480
2001	15,096
2002	4,320
2003	1,040
2004	3,040
2005	3,360
2006	3,120
2007	4,960
2008	10,080
2009	40,640
2010	43,600
2011	45,360
2012	51,920
2013	50,080
2014	63,360
2015	40,490
2016	50,040



One Line Visual of Electric Service to Greenwood Drive In

